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RESEARCH ARTICLE

PERFORMANCE OF MSMES IN INDIA AND ASSAM: A STATISTICAL ANALYSIS.

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Abstract

The importance of the MSME sector in the Indian Economy is well established. In this paper an attempt is made to analyze the comparative performance of MSMEs in India and Assam, during the period 2006-07 to 2010-11 with respect to number of enterprises, production, investment and employment. Significant relationship is found between India and Assam with regard to performance on these indicators. Also the regression function between production and investment of India and Assam are determined and compared.

Introduction:-

The Micro, Small and Medium Enterprises (MSMEs) play a catalytic role in the process of economic development of most countries of the world. Leutkenhorst (2004) states that the MSMEs use more labour intensive production processes thus boosting employment and leading to more equitable distribution of income, provide livelihood opportunities through simple, value-adding processing activities in agriculture based economies; nurture entrepreneurship and support the building up of systematic productive capacities and the creation of resilient economic system, through linkages between small and large enterprises.

MSMEs occupy a dominant position in the Indian Economy, with a significant contribution to GDP, industrial production, employment generation and exports. It is estimated that the SSIs/MSMEs in the Indian economy account for about 37% of total manufactured output and 33% of total exports of the country. As the second largest employer, this sector employs about 110 million people in over 48 million units spread across the country, the labour intensity in this sector being about 5 times higher than that of the large industries. Also these enterprises offer a wide spectrum (over 6000) of products for mass consumption (Annual Report, 2014-15).

Objectives:-

1. To undertake an analysis of the comparative performance of MSME sectors of India and Assam with respect to number of enterprises, production, employment and investment during the study period 2006-07 to 2010-11.
2. To determine regression functions between production and investment of India and Assam and compare them.

Methodology:-

The analysis is based on secondary data from the Annual Reports of MSMEs. Only five years data (2006-07 to 2010-11) with regard to all four indicators is available on the North East including Assam in the Annual Reports up till 2015-16. Therefore we have selected these five years as the study period. The data is analyzed with the help of descriptive statistical tools like mean, standard deviation (SD), coefficient of variation (C.V.) and Karl Pearson's

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coefficient of correlation(*r*). Bivariate linear regression analysis is done for determining the regression function between production and investment in case of India and Assam.

Statistical Analysis and Interpretation:-

(A) In this section we present the selected data of the four indicators of performance viz., number of enterprises, production, investment and employment and undertake a comparative analysis between India and Assam with the help of statistical tools. Standard deviation is the most widely used measure of dispersion. It measures the absolute dispersion or variability of a distribution from an average value. However, it is an absolute measure and not very useful for comparisons. A corresponding relative measure of dispersion coefficient of variation is used to compare the variability of two or more distributions. Correlation is a statistical device which helps us in analyzing the co-variation of two or more variables (Gupta, 2002). Karl Pearson's coefficient of correlation is a relative measure of co-variation.

Table 1:- Comparison of No. of Enterprises : India and Assam (2006-07 to 2010-11)

Year	No of enterprises(in lakhs)	
	India	Assam
2006-07	261.12	0.19864
2007-08	272.79	0.21618
2008-09	285.16	0.23249
2009-10	298.08	0.24927
2010-11*	311.52	0.26887
S.D.	17.83	0.024557
C. V.	6.24	10.53
Coefficient of Correlation	0.99963	

*Projected

Source: MSME Annual Report, 2011-12, Ministry of MSME, Govt. of India, New Delhi.

From table 1, it is observed that there is an increasing trend in number of working enterprises during the study period in both India and Assam. The variability as indicated by the C.V. is much less in the series on India (6.24%) than on Assam (10.53%). It means that the former is more consistent/uniform or stable than the latter. There is a strong positive correlation (0.99963) between India and Assam in number of enterprises.

Table 2:- Comparison of Production : India and Assam (2006-07 to 2010-11).

Year	Production (in crores) and in current prices	
	India	Assam
2006-07	709398	9389
2007-08	790759	10218
2008-09	880805	10989
2009-10	982919	11782
2010-11*	1095758	12709
S.D.	136749.4933	1160.83
C. V.	15.33	10.53
Coefficient of Correlation	0.998837	

*Projected

Source: MSME Annual Report, 2011-12, Ministry of MSME, Govt. of India, New Delhi.

In table 2 we compare the performance of India and Assam in terms of production wherein we observe an increasing trend for both India and Assam. The C.V. shows that there is more variability in the series on India than Assam. There is a strong positive correlation between India and Assam in production.

Table 3:- Comparison of Employment: India and Assam (2006-07 to 2010-11)

Year	Employment in lakhs	
	India	Assam
2006-07	595.66	2.10507
2007-08	626.34	2.29095
2008-09	659.35	2.46379
2009-10	695.38	2.64162
2010-11*	732.17	2.84933
S.D.	48.40964	0.260237
CV	7.31	10.53
Coefficient of Correlation	0.999483	

*Projected

Source: MSME Annual Report, 2011-12, Ministry of MSME, Govt. of India, New Delhi.

In table 3 we compare the performance of India and Assam in terms of employment which also shows an increasing trend. The C.V. shows that there is more variability in the series on Assam than India. There is a strong positive correlation between India and Assam in employment.

Table 4:- Comparison of Investment : India and Assam (2006-07 to 2010-11).

Year	Fixed investment in Crores	
	India	Assam
2006-07	500758	5867
2007-08	558190	6386
2008-09	621753	6867
2009-10	693835	7363
2010-11*	773487	7942
S.D.	96530.65	725.4491
C. V.	15.33	10.53
Coefficient of Correlation	0.998825	

*Projected

Source: MSME Annual Report, 2011-12, Ministry of MSME, Govt. of India, New Delhi.

In table 4 we compare the performance of India and Assam in terms of fixed investment in which we observe an increasing trend. The C.V. shows that there is more variability in the series on India than Assam. There is a strong positive correlation between India and Assam in investment.

(B) In this section we undertake bivariate linear regression analysis between production and investment for India and Assam. Regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on one or more variables, the explanatory variables, with a view to estimating and/or predicting the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter.(Gujarati et al, 4th edition, 2005).

Table 5:- Production and investment in India during 2006-07 to 2010-11

Year	Production(Y) in crores	Investment(X) in crores
2006-07	709398	500758
2007-08	790759	588190
2008-09	880805	621753
2009-10	982919	693835
2010-11*	1095758	773487

*Projected

Source: MSME Annual Report, 2011-12, Ministry of MSME, Govt. of India, New Delhi.

We get the following the regression line for India from the above data.
$Yi = - 38265.344 + 1.463X_i$

where Y_i is an estimate of E(Y/Xi), i.e., each point on the regression line gives an estimate of the expected or mean value of Y(production) to the chosen X(investment) value. The value of β_2 or coefficient of investment is positive (= +1.463), which shows that production is an increasing function of investment. It also implies that a 1% increase in investment will increase production by 1.463%. This is consistent with a priori /theoretical expectation. The r^2 is 0.986 which implies that 98.6% of the total variance in production is explained by the regression equation. The goodness of fit remains high after adjusting for the degrees of freedom as indicated by the adjusted r^2(= 0.981).

Table 6:- Production and investment in Assam during 2006-07 to 2010-11

Year	Production(Y) in crores	Investment(X) in crores
2006-07	9389	5867
2007-08	10218	6386
2008-09	10989	6867
2009-10	11782	7363
2010-11*	12709	7942

*Projected
Source: MSME Annual Report, 2011-12, Ministry of MSME, Govt. of India, New Delhi.

We get the following regression line for Assam from the above data.
$Yi = 0.323 + 1.6X_i$

The value of β_2 or coefficient of investment is positive (= +1.6), which shows that production is an increasing function of investment. It also implies that a 1% increase in investment will increase production by 1.6%. This is consistent with a priori /theoretical expectation. The r^2 is 1 which implies that that the whole of the total variance in production is explained by the regression equation. The goodness of fit is maximum as indicated by the adjusted r^2(= 1).

Conclusion:-

From the above statistical analysis it may be concluded that there is an increasing trend in all the four indicators during the study period in both India and Assam. The correlation between India and Assam with respect to each indicator is very high. Production and investment is more consistent/uniform for Assam than India, whereas number of enterprises and employment is more consistent/uniform for India than in Assam during the five year period.

The fitted model in case of India is a good one. In accordance with theoretical expectation, β_2, the coefficient of investment is positive in sign. The high value of r^2(0.986) shows that the regression model very well explains variation in the production. Similarly we can conclude that the fitted model in case of Assam is also a good one. The value of β_2 is slightly more in Assam than in India which indicates that elasticity of production with respect to investment is more in Assam than in India.

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